

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Implementation of Section 304 of the)	CS Docket No. 97-80
Telecommunications Act of 1996)	
)	
Commercial Availability of Navigation Devices)	
)	
Compatibility Between Cable Systems and)	PP Docket No. 00-67
Consumer Electronics Equipment)	

**REPLY COMMENTS OF THE
1394 TRADE ASSOCIATION ON
THIRD FURTHER NOTICE OF PROPOSED RULEMAKING**

The 1394 Trade Association (“1394TA”) respectfully submits these Reply Comments on the Commission’s Third Further Notice of Proposed Rulemaking. In its initial Comments¹ the 1394TA demonstrated the importance of the industry-standard IEEE 1394 (“1394”) interface to the “Plug & Play” regime already adopted by the Commission, to future industry standard approaches to home networking, and to the DTV Transition. In these Reply Comments, we explain the importance and future role of this industry standard in the context of Proposals and Comments received by the Commission. The 1394TA and its members believe that many of these other Comments reinforce the vital nature of the role to be played by the industry standard “1394” technology and interface.

¹ *Commercial Availability of Navigation Devices; Compatibility Between Cable Systems and Consumer Electronics Equipment*, CS Docket No. 97-80, PP Docket No. 00-67, Third Further Notice of Proposed Rulemaking (rel. June 29, 2007) (“FNPRM”), Comments of the 1394 Trade Association. These Comments, filed August 27, 2007 and accompanied by a Motion to accept as late filed or *ex parte*, are hereby incorporated by reference.

I. IEEE 1394 PROVIDES BETTER HOME NETWORK USER EXPERIENCE THAN TECHNOLOGIES THAT LACK TRUE HIGH-QUALITY SERVICE PROVISIONS

In reference to comments filed by the 1394 Trade Association, page 4, section 4 concerning the unsuitability of other technologies to carry multiple streams of HD content², the 1394TA would like to provide clarification:

Home networks based on technologies other than IEEE 1394 lack true high-quality service provisions; they cannot provide the user experience a reasonable consumer expects, specifically, flawless delivery of perfect audio and video with reliability equal to contemporary analog/broadcast systems but with higher definition. Proposed DLNA output media include Ethernet, Wi-Fi, and Bluetooth. Each of these media has been widely deployed and utilized by applications, such as browsers, that are adequately served by best-effort (asynchronous) data transport. However, for use with high definition audio/video streams, they are not adequate because none of them can guarantee timely delivery of the content. Newer Ethernet devices utilize priorities to mitigate the problems associated with best-effort delivery of video content. This approach might well be dubbed "better-effort", as it still uses asynchronous transactions and does not provide for the guaranteed reservation of resources. Furthermore, the method depends upon isolating the installed base of Ethernet devices that do not support priority tags. Unless the newer Ethernet devices are segregated entirely

² Comments of the 1394 Trade Association, Page 4, Section 4, "*Home networks based on other technologies cannot provide the user experience a reasonable consumer should expect. DLNA is based on Ethernet and not suitable for multiple streams of HD content.*"

with other devices that support priority tags, all the benefits of the priority tags are lost. Configuration of the network to accomplish the isolation requires network expertise that cannot reasonably be expected of the typical user. Of the other two DLNA-approved media, Wi-Fi affords insufficient bandwidth for a home entertainment network and Bluetooth is only a short distance solution with insufficient bandwidth.

Current work being done on 802.1 to provide a better quality-of-service (QoS) Ethernet shows promise, but is still at least a year away from a completed standard. It would not be unreasonable to expect completion over the next 18 to 24 months. Once completed, there is no guarantee that it will interact well with the DLNA version of Ethernet.

In contrast, 1394 devices support guaranteed real-time delivery, hence true QoS, and require no special configuration to co-exist with the latest HDTV and STB products that use 1394 for HD streaming.

II. IEEE 1394 PROVIDES IP SUPPORT AND HAS MADE GREAT PROGRESS IN PROVING VALUE TO CONSUMERS

Intel Corporation's comments concerning the use of an "IP interface" for home networks and their comments concerning the value of 1394 to the consumer³ are inaccurate. One should consider the way in which this comment subtly attempts to reframe, inaccurately, matters under consideration by the Commission. One cannot compare an "IP interface" with IEEE 1394; the

³ Comments of Intel Corporation, Page 3 "...we encourage the Cable industry, device makers and the Commission to consider requiring an IP interface for home networking instead of the current IEEE 1394 requirement which has delivered very little value for consumers."

one is a transport protocol and the other is a link medium. Ethernet can be meaningfully compared with IEEE 1394— but unless one makes the mistake of considering Ethernet synonymous with IP, neither Ethernet nor IEEE 1394 can be usefully compared with IP. Even if one ignores the fact that Ethernet is inadequate for the transport of multiple HD video streams, it is undoubtedly simpler, faster and less costly to mandate IP capability for the IEEE 1394 port than it is to reengineer HDTVs, PVRs and set-top boxes to make use of Ethernet. A conversion to an Ethernet mandate would inevitably delay the digital TV transition.

The 1394TA would first like to clarify that while the current implementation of 1394 based on the Second R&O does not support IP, this is simply an implementation choice. 1394 natively supports Internet Protocol services as defined in RFC 2734, which specifies IPv4 over 1394, and RFC 3146, which specifies IPv6 over 1394. IPv4 over 1394 is more than just a specification; it is a reality. Millions of desktop and notebook computers implement IPv4 over 1394. It is unnecessary to eliminate 1394 to add IP capability; all that is required is to update the code (firmware or software) that controls the device.

Given the premise that IP will help complete the digital transition, 1394 is the obvious way to deliver IP functionality, since 1394 is already widely deployed in televisions and set-top boxes. Other media that support IP, such as Ethernet and wireless, are not presently required by the COMMISSION, nor do they deliver guaranteed real-time streaming nor are they widely deployed in the target consumer electronic equipment. With extensive development of a standards infrastructure and subsequent redesign of consumer electronic equipment, guaranteed streaming services could be added to Ethernet and possibly wireless, but the effort would delay deployment for years. Also, new streaming-capable Ethernet or wireless devices would not

gracefully coexist with older non-capable devices.⁴ An unsuspecting consumer could easily connect a “Non-DLNA” notebook with home video, photos and audio into the standard Ethernet plug used by DLNA and impair network performance. Since most residential Ethernet networks operate at 100 Mb/s, there is scant excess bandwidth to mask performance impairments with the likely result of unacceptable visible and audible problems for the user.

As to the value of 1394, the current IEEE 1394 requirement has not yet achieved its full potential, but this is not due to any technical deficiency in 1394 or its implementation and not due to any lack of IP capability. Adoption to date has been delayed by external factors, such as the changing schedule for digital transition, copyright and piracy concerns of digital content owners, and hesitation by service providers to encourage consumer choice in home networking. Ethernet, wireless, and DLNA bring nothing to the table to overcome these non-technical issues.

Please observe that significant progress has been accomplished since the September 2003 FCC R&O. At that time, the 1394 community faced many issues that would have confronted any technology in the same situation. This list includes:

- transporting the User Interface (“UI”) over 1394;
- industry agreement on content protection and Digital Rights Management;
- the lack of a digital Emergency Alert Signal; and
- some inconsistent implementations of 1394 in the STB.

⁴ Consumers who own a mixture of contemporary Ethernet devices and newer, streaming-capable Ethernet devices must carefully manage the entire network to separate, by bridges, the one type of device from the other. If this were not done, whatever benefit there might be in newer Ethernet devices would be lost. The necessary network management skills are beyond the experience of the vast majority of consumers.

While these issues were being resolved, it was difficult to design TVs compatible with various STBs and consequently difficult to deliver useful functionality. However, in recent months these issues have been resolved:

- HANA initiatives, most notably CEA 2027-B, have produced a comprehensive User Interface solution;
- CEA-775 has also been updated and improved;
- methods to restrict the network distribution of copy-protected material to a very limited geographic area, i.e., a single residence, have been agreed to in the form of DTCP “localization”;
- The Emergency Alert signal is, or will soon be, available in digital format as well as analog;
- mandated CableCard support by STBs is yielding consistent implementations across vendors; and
- fully functional STB 1394 ports have only recently become the norm rather than the exception.

The market needs time to respond to the fact that the port is now ready to be used to its fullest. HANA members are already responding to the changed environment with plans for numerous new product launches in 2008. A radical change now would penalize those companies that have worked diligently to resolve the issues that have impeded the fullest and richest use of the mandated 1394 port. It would be particularly regrettable to make such a change just as a viable 1394 solution is beginning to gain traction, just as the major obstacles have been removed.

There is another downside to the proposal made by Intel and others and that is substantial delay in realizing the Commission’s objectives. No one would argue that changes to STBs could be implemented and deployed quickly. These tasks require substantial amounts of time and significant coordination. The same considerations apply to CableCard, Conditional Access, software-definable Conditional Access and OpenCable™ platforms. The fundamental changes proposed to the FCC would reset the clock on the deployment of residential A/V networks. One

could reasonably predict that, if the proposed changes were made now, it would be years before deployment could occur.

III. IEEE 1394 OFFERS SUPERIOR IP SUPPORT TO OTHER TECHNOLOGIES

Intel Corporation's comment concerning the addition of an IP interface on the STB⁵ misleads and invites the reader to conclude that 1394 is not an IP interface. In fact, support for IP over 1394 has been standardized since 1999, is implemented by Microsoft in Windows XP, available from third-party vendors for Windows Vista and is integrated into both the Apple MAC OS and Linux operating systems. The comment also incorrectly implies, by omission, that contemporary set-top box 1394 interfaces are not protected by DTCP when in reality they are protected by the original DTCP designed specifically for 1394. Furthermore, the newer DTCP/IP copy protection mechanisms are agnostic with respect to the transport technology and function just as well over 1394 as over other IP interfaces.

From a technological perspective, IP over 1394 is arguably superior to other IP interface technologies. Because asynchronous transaction "fairness" is integral to 1394, IP datagrams transmitted by different hosts never collide, as they do with other IP interface technologies such as Ethernet, with the result that IP over 1394 is measurably more efficient than Ethernet. More importantly, IP over 1394 is designed to take advantage of 1394 isochronous data transfer, which provides true high-quality service unavailable in most other technologies, particularly Ethernet.

⁵ Comments of Intel Corporation, Page 8, Section 8, "Now that DTCP IP has been broadly approved, we believe the time is ripe for the FCC, the Cable industry and device makers to consider replacing the current IEEE 1394 set top box output requirement with an IP interface protected by DTCP. Intel believes that although there are likely to be a variety of home networking approaches, Internet Protocol will be the home networking transport of choice for most consumers."

An important consideration when comparing Ethernet and 1394 is that 1394 supports both isochronous *and* asynchronous services while Ethernet (and Wi-Fi) can only support asynchronous service. A network is only as reliable as its weakest point. The moment data moves onto an asynchronous segment of a network, guaranteed QoS is forever lost. With a 1394 port on the STB, consumers and manufacturers can choose to continue to utilize 1394 and maintain guaranteed QoS, or they can bridge to Ethernet or Wi-Fi with the resulting degradation in QoS. However, if the STB port were to be changed to Ethernet, there is no longer any choice. Even if it is subsequently bridged to 1394, QoS can never again be guaranteed since the limitation is the Ethernet link.

IV. THE INCLUSION OF IEEE 1394 IN STBs IS BASED ON A MULTILATERAL AGREEMENT

Comcast characterizes the CEA proposal as being “highly regulatory” in nature.⁶ The 1394TA would like to point out that the Report and Order dating from September 2003 September is based upon a December 2002 agreement between the NCTA and the CEA, signed by eight members of the cable industry and 14 members of the Consumer A/V industry. Multilateral agreements such as this are much more likely to succeed than unilateral decisions that have failed to gain “buy-in” from all parties. 1394 was included in STBs by agreement from members of all of the industries involved. As noted above, a number of issues that were left to the industry to manage. These issues have only recently been resolved, which now enables the

⁶ Comments of Comcast Corporation, Page 4, “*The CEA proposal represents a highly regulatory wish list of certain CE companies that would rather cede marketplace decisions to the government....*”

realization of Commission's vision for cable systems and a retail market for STBs that are compatible with consumer electronic products.

V. SHARING ELECTRONIC PROGRAM GUIDE SHOULD NOT BE MANDATED

In response to comments filed by the Home Networking Proponents concerning the cable operator Electronic Program Guide, equivalent content and services⁷, the 1394TA would like to point out that the Electronic Program Guide ("EPG") represents added value provided by MSOs to their subscribers; it is their presence (or "face") that greets the consumer. In these two ways, the EPG is no different from the navigable menus presented by televisions, personal video recorders (such as TiVo) or software applications on a computer. Were the Commission to mandate that the data used to construct TV, PVR, or PC screens be made available to all competitors, there would be vigorous protest in response. Yet the same companies that would strenuously object to the application of such a mandate to themselves are asking that the Commission impose this unpalatable burden on the MSOs. There are other sources of this data; it can be purchased or licensed. In fact the CEA has recently approved a standard for delivering EPG metadata, CEA-2033, which was developed by many of the same companies that are signatories to the above proposal.

With regard to the second request, that equivalent content and services be provided to a network interface, the 1394TA points out that the content is already available on the 1394 port;

⁷ Comments of the Home Networking Proponents, Pages 2 and 3, "*Core among these proposals is that cable operators: (1) be prohibited from limiting in a discriminatory manner the content and services (including electronic program guide ("EPG") data) they make available to consumers utilizing devices on a home network; and (2) be required to make generally available to subscribers, no later than 18 months following Commission adoption of bidirectional plug and play rules in this proceeding, a device with an interface to a DLNA network that delivers equivalent content and services provided by their non-networked set-top boxes ("STBs").*"

there is no need to mandate anything new in that area. The 1394TA does support making the MSO's EPG available on the home networking port. However, rather than creating a new mandate, HANA and 1394TA members are working with CableLabs and MSOs to define a means to enable the OpenCable Platform UI (including the EPG) over the 1394 network. We believe that this is a better way to proceed.

VI. MPAA CONTENT PROTECTION CONCERNS ARE VALID

The Motion Picture Association of America, Inc. brings up a valid point concerning the lack of participation they are afforded in the copy protection decisions being made in the DLNA⁸. As a point of clarification, according to the DLNA web page (<http://www.dlna.org/en/industry/about/roster>), they have fewer than 250 members, not the 300 referenced in the MPAA comments. However, the real decision making power rests with the 24 "Promoter Members" and not with the roughly 200 regular "Member Companies." Information on fee structure for becoming a Promoter is not available on the public DLNA web page, nor is the process for become a Promoter, however according to a DLNA press release dated July 12, 2005 "Invitation to promoter membership is determined by the DLNA board of directors." Therefore, a group of eight companies controls access to this elite decision making group. Since

⁸ Comments from the Motion Picture Association of American, Inc, Page 19, Section D.1., "*The DLNA, however, fails to provide content owners with a meaningful opportunity to participate and offer input in discussions about appropriate content protection and presentation systems. While DLNA currently has about 300 members, including MPAA, neither MPAA nor any of its member companies has the right to vote on DLNA decisions, such as those that impact the use or movement of copyrighted content licensed to cable operators.*" and on page 20, same section "*DLNA simply does not provide content owners with a fair opportunity to participate in such decisions and thus should not be considered as an appropriate forum for approving digital outputs in two-way devices.*"

neither the MPAA nor any movie studio, television network, recording company, or other traditional content owner is a Promoter Member, they are justified in claiming that they are being shut out of the decision making process.

For over 10 years, 1394 Trade Association member companies have been cooperating with the movie studios; visits to the Copy Protection Technology Working Group go back as far as 1996. The MPAA's concerns are valid and must be addressed before any content beyond "in the clear" broadcast video can be transmitted on any home network. This does not happen overnight. The "video" most often referred to by the DLNA is "home video" or "TV shows" which are labeled as "Copy Freely" by the DTCP copy protection scheme. Content from HBO and other production companies will not be available in a DLNA network until an agreement has been reached and products have been shipped in compliance with that agreement. It is highly unlikely that this can be accomplished in one year to meet the start of the Christmas 2008 buying season.

VII. DLNA IS NOT READY FOR DIGITAL TRANSITION DEADLINE

EchoStar Satellite, L.L.C. characterizes the availability of DLNA devices in the market⁹ in a manner that is more significant than merited. Of the roughly 700 products listed on the DLNA web site (http://product.dlna.org/eng/browse_cat.aspx), 86% are computers. Of these computers 98% are made by three computer makers (Sony, NEC, and Acer) without a single computer from the top two PC makers, Dell and HP. Of the remaining products listed on the DLNA web page, (after digital cameras and audio systems are removed) only 20% are for the

⁹ Comments from EchoStar Satellite, L.L.C, Page 6, "Given that there are DLNA devices on the market today, there is a clear path to achieve the Commission's goals in a timely manner."

North American market. That leaves fewer than 20 products, of which only 8 are DTVs. By comparison, as of September 10, 2007, over 100 models of 1394 enabled HDTVs are available in the North American market.

Additionally, there are no STBs listed on the DLNA web page. The CEA proposal requests an 18-month phasing in period following FCC adoption, which entirely misses the February 2009 digital transition date. Today, by contrast, there are over 20 million STBs in the field with 1394 based on sales figures provided to the 1394TA by member companies in the semiconductor industry.

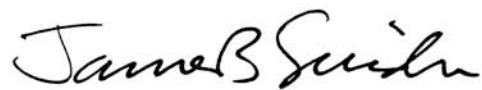
VIII. CONCLUSION.

The 1394 Trade Association is aligned with other interested parties with respect to the use of IP as a common transport protocol for device discovery, command, control and status operations throughout the network. We recognize that "common reliance" on agreed technologies and standards is necessary for both the transition to digital TV and the realization of the residential HD A/V network, but we caution the Commission that agreement as to what is "common" can be uncommonly difficult to attain. Preference should be given to technologies, protocols and other methods that are either deployed or already prototyped and nearing deployment. Consideration should also be given to the same insofar as they are harmonious and create the possibility of heterogeneous networks. 1394 Trade Association believes that IEEE 1394, in combination with the initiatives undertaken by HANA and the CEA, satisfies the requirements for digital transmission and additionally enables interconnection with contemporary Ethernet and future Ethernet that supports quality of service.

In conclusion, in order to meet the commission's goals for DTV and network deployment, it is ESSENTIAL that a common interface be mandated for the STBs, DTVs, PVRs and other

components. The common interface need not preclude interconnection, via bridges, with other interfaces, but it must enforce a base level of compatibility that permits interoperation between devices. It is additionally ESSENTIAL that this common interface be available for timely deployment. We respectfully submit that not only is IEEE 1394 a superior interface but that it is the only interface sufficiently mature, with a sufficiently developed infrastructure, to meet the Commission's timeline.

Respectfully submitted,

A handwritten signature in black ink, reading "James B. Snider". The signature is written in a cursive style with a large, stylized "J" and "S".

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